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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/224,401	12/31/1998	SRINATH HOSUR	TI-28734	3730

23494 7590 06/17/2002

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ART UNIT	**PAPER NUMBER**
2662	18

DATE MAILED: 06/17/2002

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 18

Application Number: 09/224,401
Filing Date: 12/31/98
Appellant(s): Hosur et al.

Robert Rountree
For Appellant

Mailed
JUN 17 2002
Technology Center 2600

EXAMINER'S ANSWER

This is in response to appellant's Reply Brief filed 05/29/02.

The real party of interest has been corrected as Texas Intrusments Incorporated in accordance to the previous Appeal Brief filed on 7/30/01.

(1) Real Party in Interest

Texas Instruments Incorporated is the real party in interest.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The

Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-28 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,056,109	GILHOUSEN et al.	10-1991
6,029,056	KIYANAGI et al.	02-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilhousen et al in view of Kiyanagi et al..This rejection is set forth in prior Office action, Paper No. 14.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1- 8, 10, 12-28 are rejected under 35 USC 103(a) as being unpatentable over **Gilhousen et al.** (US Pat. No. 5,056,109) in view of **Kiyanagi et al.** (US Pat. No. 6,029,056).

- Regarding claims 1, 2, 12, 17-19 and 22,

A control circuit receives the output signal and a reference signal;

Gilhousen et al. *discloses, in Fig.3, a power control system using CDMA method represented by a base station receiver. A power measurement 60 receives a multipleof mobile unit transmitted signals via an antenna 52, analog receiver 54, and digital data receiver 56 (a measurement circuit receives signals). See col.12, lines 35-60 & Abstract. Fig.6 illustrates a detail power*

control system of Fig.3 in which a comparator 120 receives a desired power level set by a control processor 78 along with the output signal outputted from the power average circuit 118 (a control circuit receives the output signal and a reference signal). See col.16, lines 27-30.

The control circuit is arranged to produce a control signal in response to a comparison of the output signal and the reference signal;

The comparator 120 compares the two signals and provides an output signal indicative of the deviation of the average power level from the desired power level (the control circuit is arranged to produce a control signal in response to a comparison of the output signal and the reference signal). See col.16, lines 30-35.

Gilhousen et al. does not disclose the first input signal and the second input signal are transmitted from different antennas; and the measurement circuit outputs a signal that corresponds to the two input signals.

The measurement circuit receives two input signals from a first input antenna and the second antenna; and the measurement circuit outputs a signal that corresponds to the two input signals;

Kiyanagi et al. *discloses, in Fig.1, a space diversity receiver that receives input signals S1, S2 at two spatially separated antennas 20, 21 (the measurement circuit receives two input signals from a first input antenna and the second antenna). The signals S1 and S2 are combined by a combiner 23 to produce an output signal S3 that corresponds to the two input signals (the measurement circuit outputs a signal that corresponds to the two input signals). See col.5, line*

65 to col.6, line 10. Therefore, it would have been obvious to use the combiner 23 of **Kiyanagi et al.** that output an output signal which is compared to a threshold signal power in the power control system of **Gilhousen et al.** in order to control signal power transmitted from mobile station.

- Regarding claim 25, receiving at least a control signal transmitted from an external source;

Gilhousen et al. *discloses, in Fig.6, that after the comparator 120 compares the two input signals and provides an output signal indicative of the deviation of the average power level from the desired power level, the output signal is provided to power up/down command generator 122 which generates either a power-up or power-down command to cell-site transmit modulator (receiving at least a control signal transmitted from an external source) for transmission and control of transmitter power of mobile unit N (producing and transmit a transmit power level of each antenna in response to the control signal). See col.16, lines 30-40.*

- Regarding claims 13, 15 and 16, the limitations of these claims have been addressed in claim 1.

- Regarding claims 3, 14 and 20, first and second input signals is a wideband CDMA;

Gilhousen et al. *discloses, in Fig.3, that digital data receiver 56 receives the wideband spread spectrum signals for correlating and despreading the mobile unit (first and second input signals is a wideband CDMA). See col.12, lines 50-55.*

- Regarding claim 4, the limitation of this claim has been addressed in claim 1.

- Regarding claim 5, the limitation of this claim has been addressed in claim 1.

- Regarding claim 6, the limitation of this claim has been addressed in claim 25.

- Regarding claims 7 and 21, each of the first and second predetermined signal has a predetermined values;

Gilhousen et al. *discloses, in Fig.3, a comparison process between a received power measurement and a preset power level as a proof to show that each of the transmitted input signal has a predetermined value. In particularly, when the received power measurement is greater than the preset level, the adjustment command is generated such that the mobile unit transmitter power is reduced. When the received power measurement is less than the preset level, the power adjustment command data bits are generated to indicate that an increase in mobile unit transmitter power is necessary (each of the first and second predetermined signal has a predetermined values). See col.13, lines 1-10.*

- Regarding claim 8, the limitation of this claim has been addressed in claims 1 and 7.

- Regarding claim 10, first and second signals are Rayleigh fading parameter estimate;

Gilhousen et al. *discloses that the mobile unit transmitted signal experiences Ray-Leigh fading before arriving at the cell-site receiver. Corrections are made at the mobile unit to correct for Ray-Leigh fading in the cell-site transmitted signal (first and second signals are Rayleigh fading parameter estimate). See col.12, lines 1-15.*

Claim 11 is rejected under 35 USC 103(a) as being unpatentable over **Gilhousen et al.** (US Pat. No. 5,056,109) in view of **Kiyanagi et al.** (US Pat. No. 6,029,056), and further in view of **Sousa et al.** (US Pat. No.5,832,044).

- Regarding claim 11, the total path diversity of the first and the second input signals is at least twice a number of transmitting antennas;

Gilhousen et al. *does not disclose the total path diversity of the first and the second input signals is at least twice a number of transmitting antennas.* ***Sousa et al.*** *disclose that the transmission bit rate can be increased with no loss in performance and without using more bandwidth by transmitting two carriers that are in phase-quarature from each antenna This ensures the 2L signals (where L is the number of antennas as discussed in claim 1) do not interfere with one another and the bandwidth efficiency is twice as high (the total path diversity of the first and the second input signals is at least twice a number of transmitting antennas). See col.7, lines 15-27. Therefore, it would have been obvious to one having ordinary skill in the art to combine the fading resistance transmission as disclosed by* ***Sousa et al.*** *with the power control system using CDMA method as disclosed by* ***Gilhousen et al.*** *to arrive at the claimed invention in order to resist fading and increase the bandwidth efficiency.*

- Regarding claim 23, the limitations of this claim have been addressed in claims 1 and 21.

- Regarding claim 24, the limitation of this claim have been addressed in claim 8.

- Regarding claim 26, the limitation of this claim has been addressed in claim 19.

- Regarding claim 27, the respective transmit power level has a same transmit power adjustment for antenna in response to one transmit power control signal;

Gilhousen et al. *discloses, in Fig.6, if the received power at the cell-site is higher than that desired of mobile unit N, then a power-down command is generated and transmitted to mobile unit N. If the received power at the cell-site is too low, then a power-up command is generated and transmitted. The power adjustment command feedback compensates for changes in the inbound channels that are independent of the outbound channels. Thus, the power adjustment command feedback is used top compensate for adjustments in mobile unit transmitter power based on the inbound channel path losses (the respective transmit power level has a same transmit power adjustment for antenna in response to one transmit power control signal). See col.16, lines 41-64.*

- Regarding claim 28, the limitation of this claim has been addressed in claim 1.

Allowable Subject Matter

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 9 is object because the prior art does not disclose the measurement, the control circuit and the estimate circuit are formed on the integrated circuit.

Claims 29-45 are allowed.

(11) Response to Argument

A. Introduction: Prior to responding to the arguments, the examiner would like to describe the summary of claimed invention.

The invention is related to a power control with space diversity for WCDMA signals. A measurement circuit is coupled to receive a first input signal from a first antenna of a transmitter and coupled to receive a second input signal from a second antenna of the transmitter. Each of the first and second signals is transmitted at a first time. The measurement circuit produces an output signal corresponding to a magnitude of the first and second signals. A control circuit is coupled to receive the output signal and a reference signal. The control circuit is arranged to produce a control signal at a second time in response to a comparison of the output signal and the reference signal.

B. Description of References

Gilhousen et al. discloses a power control system which controls transmission signal power of a mobile telephone. Transmitted signal power from the mobile telephone is received and measured at a base station. The base station generates a power command signal which is transmitted to the mobile telephone for adjusting the mobile telephone 's transmission power. The command signal is resulted from a deviation between a transmission signal power actually received and a threshold signal power of the base station. The power control system of **Gilhousen et al.** overcomes the claimed invention by having two received signals using

Rayleigh fading (Producing a control circuit in response to a comparison of the output signal and the reference signal). See Abstract.

Kiyanagi et al. discloses a space diversity receiver that receives a signal S1 and a signal S2 at antennas 20 and 21 respectively (a measurement circuit receives a first input signal from a first antenna and receives a second input signal from a second antenna of the transmitter). The two signals S1 and S2 are combined by a combiner 23 which outputs an output signal S3 (an output signal corresponds to the magnitude of the first and the second signals is produced by a measurement circuit). See Fig.1.

Kiyanagi et al. is combined with **Gilhousen et al.** because the combiner 23 of **Kiyanagi et al.** outputs an output signal S3 corresponding to the two input signals S1, S2. The output signal S3 is compared with a threshold signal power of **Gilhousen et al.** in order to produce a command signal.

C. Response to the Arguments

Applicant argues that **Kiyanagi et al.** does not disclose the two signals are received from two antennas of a transmitter. Examiner would like to direct back to claim 1.

Kiyanagi et al. discloses a space diversity receiver that receives a signal S1 and a signal S2 at antennas 20 and 21 respectively (a measurement circuit receives a first input signal from a first antenna and receives a second input signal from a second antenna of the transmitter). The two signals S1 and S2 are combined by a combiner 23 which outputs an

output signal S3 (an output signal corresponds to the magnitude of the first and the second signals is produced by a measurement circuit). See Fig.1.

Applicant begins the claim language by addressing "a measurement circuit coupled to receive a first input signal from a first antenna **of a transmitter** ...a second antenna **of the transmitter**". The first input signal and the second input signal are not neccessarily associated with the first antenna and the second antenna located at the transmitter transmitting the two input signals. The applicant does not specifically address whether the first and the second antennas are associated with the transmitter that transmits the signals or associated with the receiver that receives the signals. In the space diversity receiver, the two antennas 20 and 21 receive two signals S1, S2 coming from diferent directions. The two received signals S1, S2 must come from two separated antennas aiming at two different directions to achieve space diversity at a transmitter. The antennas 20, 21 are spaced apart to receive the two signals S1, S2 from different directions. Therefore, each antenna at the receiver is associated with a specific antenna at the transmitter, which meets the limitations as stated in the claim.

Gilhousen et al. discloses a power control system which controls transmission signal power of a mobile telephone. Transmitted signal power from the mobile telephone is received and measured at a base station. The base station generates a power command signal which is transmitted to the mobile telephone for adjusting the mobile telephone 's transmission power. The command signal is resulted from a deviation between a transmission signal power actually received and a threshold signal power of the base station. The power control system of

Gilhousen et al. overcomes the claimed invention of space diversity by having received signals using fading. (Producing a control circuit in response to a comparison of the output signal and the reference signal). See Abstract.

The motivation for combining the reference is that the reference of **Gilhousen et al.** refers to fading and the reference of **Kiyanagi et al.** teaches utilizing space diversity to overcome fading.

The examiner believes that each antenna at the receiver is associated with an antenna at the transmitter. The claim does not specifically state whether the antenna is located at the transmitter or the receiver. Therefore, the claim reaches on the references of **Gilhousen** and **Kiyanagi.**

For the above reasons, it is believed that the rejections should be sustained.

Respectively Submitted

Examiner

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Primary Examiner

HN

June 12, 2002

Conferee:

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